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THE
Connecticut Agricultural Experiment Station.

NEW HAVEN, CONN.

BULLETIN No. 94.

APRIL, 1888.

NOTICE.

The Bulletins and Reports of this Station are sent free to every citizen of Connecticut who applies for them. As required by law, two copies of each Bulletin are sent to every post-office in the State. One copy is sent to every Connecticut newspaper and to every Grange, Farmers' Club and Agricultural Society. Bulletins and reports are also sent to the leading agricultural newspapers of the East and will be sent to any agricultural paper that may desire to exchange.

During the next two months agents of the Station will visit all sections of the State to draw samples of fertilizers. At request of Granges, Farmers' Clubs or other organizations which have bought fertilizers in considerable quantity the Station will endeavor to send an agent to draw samples from the stock before it is distributed. For gratuitous analyses in such cases it is required that the prices paid for the fertilizers shall be made known to the Station. This information is necessary in order to make the analyses of value to the public.

The Station will be glad to receive notice from farmers of any new brands of fertilizers which are being introduced into the State.

THE TRADE-VALUES FOR 1888 OF FERTILIZING INGREDIENTS
IN RAW MATERIALS AND CHEMICALS.

The average Trade-Values or *retail cost per pound* of the ordinarily occurring forms of nitrogen, phosphoric acid and potash as found in the New England, New York and New Jersey markets, are as follows :

	Cts. per lb.
Nitrogen in ammonia salts	17½
nitrates	16
Organic nitrogen in dry and fine ground fish, meat, blood, cotton-seed meal and castor-pomace	16½
in fine bone and tankage	16½
in fine medium bone and tankage	13
in medium bone and tankage	10½
in coarser bone and tankage	8½
in hair, horn shavings and coarse fish scrap	8
Phosphoric acid, soluble in water	8
in ammonium citrate*	7½
in dry ground fish, fine bone and tankage	7
in fine-medium bone and tankage	6
in medium bone and tankage	5
in coarser bone and tankage	4
in fine ground rock phosphate	2
Potash as high-grade Sulphate and in forms free from Muriate (or Chlorides)	5½
as kainit	4¼
as muriate	4¼

* Dissolved from 2 grams of the unground phosphate previously extracted with pure water, by 100 c. c. neutral solution of Ammonium Citrate, sp. gr. 1.09, in 30 minutes, at 65° C., with agitation once in five minutes. Commonly called "reverted" or "backgone" Phosphoric Acid.

These Trade-Values have been agreed upon by the Experiment stations of New Jersey, Massachusetts and Connecticut for use in their respective States during 1888. They are the average prices at which in the six months preceding March the respective ingredients could be bought at retail for cash in our large markets, in the raw materials which are the regular source of supply. They also correspond to the average wholesale prices for the six months ending March 1st, plus about 20 per cent. in case of goods for which we have wholesale quotations. The valuations obtained by use of the above figures will be found to agree fairly with the *average retail price* at the large markets of standard raw materials such as :

Sulphate of Ammonia,	Azotin,
Nitrate of Soda,	Ammonite,
Dried Blood,	Dry Ground Fish,
Muriate of Potash,	Bone and Tankage,
Sulphate of Potash,	Ground So. Carolina Rock,
Plain Superphosphate.	

TRADE VALUES IN SUPERPHOSPHATES, SPECIAL MANURES AND MIXED FERTILIZERS OF HIGH GRADE.

The organic nitrogen in these classes of goods is reckoned at the price of nitrogen in raw materials of the best quality.

Insoluble Phosphoric Acid is reckoned at 3 cents, unless found to be from rock phosphate. In this latter form Insoluble Phosphoric Acid costs but 2 cents per pound. Potash is rated at $4\frac{1}{4}$ cents, if sufficient chlorine is present in the fertilizer to combine with it to make muriate. If there is more Potash present than will combine with the chlorine, then this excess of Potash is reckoned at $5\frac{1}{2}$ cents.

In most cases the valuation of the Ingredients in Superphosphates and Specials falls below the retail price of these goods. The difference between the two figures represents the manufacturer's charges for converting raw materials into manufactured articles. These charges are for grinding and mixing, bagging or barreling, storage and transportation, commission to agents and dealers, long credits, interest on investment, bad debts, and finally, profits.

The majority of manufacturers agree that the average cost of mixing, bagging, handling and cartage ranges from \$3.00 to \$4.50 per ton.

In 1887 the average selling price of Ammoniated Superphosphates and Guanos was \$35.74, the average valuation was \$28.45, and the difference \$7.29—an advance of 25.6 per cent. on the valuation and on the wholesale cost of the fertilizing elements in the raw materials.

In case of Specials the average cost was \$42.52, the average valuation \$35.20, and the difference \$7.32, or 20.9 per cent. advance on the valuation.

To obtain the Valuation of a Fertilizer (i. e. the money-worth of its fertilizing ingredients), we multiply the pounds per ton of Nitrogen, etc., by the trade-value per pound. We thus get the

values per ton of the several ingredients, and adding them together we obtain the total valuation per ton.

The analyses given in this Bulletin are chiefly of raw materials and show their quality and the actual cost of the nitrogen, phosphoric acid or potash which they contain.

NITRATE OF SODA.

2190. Sold by the Rogers & Hubbard Co., Middletown, guarantee 98.75 pure nitrate of soda.

2176. Sold by L. Sanderson, New Haven, guarantee 19-20 ammonia.

ANALYSES.		
	2190	2176
Moisture.....	.35	.85
Salt (sodium chloride).....	.23	.33
Sulphate of soda.....	.21	.16
Pure nitrate of soda.....	99.21	98.66
	<hr/> 100.00	<hr/> 100.00
Contains nitrogen.....	16.37	16.28
Cost per ton.....	\$52.00	50.00
Nitrogen costs per pound.....	15.9 cts.	15.4 cts.

SULPHATE OF AMMONIA.

2213. Made by C. Meyer, Jr., Maspeth. From stock bought by G. F. Platt, Milford, for home mixtures.

2217. Made by C. Meyer, Jr. From stock bought and sampled by C. T. Merwin & Son, Milford.

ANALYSES.		
	2213	2217
Nitrogen.....	20.15	20.12
Equivalent ammonia.....	24.46	24.42
Cost per ton.....	\$71.60*	71.60*
Nitrogen costs per pound.....	17.8 cts.	17.9 cts.

* Ton lots in Milford.

COTTON SEED MEAL.

2172. Sold by F. S. Harmon, Suffield. Sampled and sent by H. K. Wright, Suffield.

2173. Sold by W. W. Cooper, Suffield. Sampled and sent by H. K. Wright, Suffield.

2201. Sold by J. E. Soper & Co., Boston. Sampled and sent by C. W. Austin, Suffield, from stock bought by him.

2202. Light colored, from stock of R. H. Ensign, Simsbury. Sampled and sent by J. C. Eddy, Simsbury.

2203. Dark colored, from stock of J. & H. Woodford, Avon. Sampled and sent by J. C. Eddy, Simsbury.

ANALYSES.

	2172	2173	2201	2202	2203
Nitrogen.....	7.38	7.13	6.95	7.65	6.97
Phosphoric acid.....	3.06	3.40	3.11	2.81	3.60
Potash.....	1.91	1.91	1.96	1.81	2.09
Cost per ton.....	\$25.00	26.00	25.00	25.00	25.00
Nitrogen costs per pound*	12.6 cts.	13.4 cts.	13.3 cts.	12.5 cts.	12.7 cts.

* Reckoning phosphoric acid at 7 cents and potash at $5\frac{1}{2}$ cents per pound.

Cotton seed meal at the present time is one of the cheapest sources of organic nitrogen.

DISSOLVED BONE BLACK.

2182. Sold by L. Sanderson, New Haven, guaranteed 16-18 per cent. available.

2214. Sold by C. Meyer, Jr., Maspeth, L. I., guaranteed 16-18 per cent. available. From stock bought by G. F. Platt, Milford.

ANALYSES.

	2182	2214
Soluble phosphoric acid	15.68	14.55
Reverted phosphoric acid85	2.39
Insoluble phosphoric acid	none	.20
Cost.....	\$26.00	26.00
Soluble phosphoric acid costs per pound*.....	7.9 cts.	8.2 cts.

* Reckoning reverted acid at $7\frac{1}{2}$ cents and insoluble at 2 cents per pound.

POTASH SALTS.

Muriates.

2177. Stock of L. Sanderson, New Haven, 80-85 per cent. muriate guaranteed.

2188. Stock of Rogers & Hubbard Co., Middletown, 80 per cent. muriate guaranteed.

2212. Sold by C. Meyer, Jr., Maspeth, L. I., 82 per cent. muriate guaranteed. From stock bought by G. F. Platt, Milford.

Sulphates.

2178. Stock of L. Sanderson, New Haven, guaranteed 50-55 per cent. sulphate of potash.

2209. Sold by C. Meyer, Jr., Maspeth, 95 per cent. sulphate guaranteed. From stock bought by G. F. Platt, Milford.

	Potash Muriate.			Potash Sulphate.	
	2177	2188	2212	2178	2209
Actual potash	51.17	50.88	52.52	27.76	51.28
Equivalent muriate	81.0	80.6	83.2	----	----
Equivalent sulphate....	----	----	----	51.3	94.8
Cost per ton.....	\$41.50	43.00	40.00	30.00	60.00
Potash costs per pound	4.05 cts.	4.21 cts.	4.0 cts.	5.4 cts.	6.0 cts.

COTTON HULL ASHES.

2184. Sold by Charles L. Spencer, Suffield. Sampled and sent by C. M. Owen, Suffield.

2198. Sold by J. E. Soper & Co., Boston. Sampled and sent by J. A. DuBon, Suffield.

2204. Sold by J. E. Soper & Co., Boston. Sampled and sent by H. W. Alford, Poquonock.

ANALYSES.			
	2184	2198	2204
Soluble phosphoric acid32	2.56	1.64
Reverted phosphoric acid.....	6.98	7.24	7.08
Insoluble phosphoric acid.....	.91	.67	1.36
Potash.....	22.67	25.56	23.78
Cost per ton	\$35.00	*	*
Valuation per ton	\$36.28	43.35	39.94
Potash cost per pound†	5.2 cts.	----	----

* \$30 in car lots.

† Reckoning soluble and reverted phosphoric acid as in mixed fertilizers and insoluble phosphoric acid at 2 cents per pound.

BONE AND TANKAGE.

Tankage.

2175. Western Tankage. Stock of L. Sanderson, New Haven. Guarantee 6-8 ammonia, 10-12 phosphoric acid.

2183. New York Tankage. Stock of L. Sanderson. Guarantee 6-8 ammonia, 10-12 phosphoric acid.

2210. New York Tankage. Sold by C. Meyer, Jr., Maspeth. From stock bought by G. F. Platt, Milford. Guarantee 9 ammonia, 5 phosphoric acid.

Bone.

2208. Bradley's Pure Fine Bone. Made by Bradley Fertilizer Co., Boston, Mass. From stock purchased by Greens Farms Farmer's Club. Guarantee 3.3 nitrogen, 21 phosphoric acid.

2179, 2180 and 2181. Different consignments of bone. Stock of L. Sanderson, New Haven. Guarantee 3.5-4 ammonia, 20-22 phosphoric acid.

2185. Raw Knuckle Bone Flour. Guarantee 3.9 nitrogen, 24.6 phosphoric acid.

2191. Pure Ground AX Bone. Guarantee 3.9 nitrogen, 22.5 phosphoric acid.

2192. Strictly Pure Fine Bone. Guarantee 3.8 nitrogen, 22.7 phosphoric acid.

The three last are from stock made and sold by the Rogers & Hubbard Co., Middletown, with guarantee that the cost f. o. b. Middletown shall not exceed valuation.

2211. Sold by C. Meyer, Jr., Maspeth, L. I. From stock bought by G. F. Platt, Milford. Guarantee 4-5 ammonia, 20-22 phosphoric acid.

MECHANICAL ANALYSES.

	2175	2183	2310	2308	2179	2180	2181	2185	2191	2192	2211
Fine, smaller than $\frac{1}{16}$ inch -----	64	58	21	74	56	52	74	66	42	42	52
Fine medium, smaller than $\frac{1}{8}$ inch -----	21	25	19	26	41	33	23	27	25	28	36
Medium, smaller than $\frac{1}{4}$ inch -----	14	17	17	--	3	15	3	7	23	30	12
Coarser than $\frac{1}{2}$ inch -----	1	--	43	--	--	--	--	--	10	--	--
-----	100	100	100	100	100	100	100	100	100	100	100

CHEMICAL ANALYSIS.

Nitrogen -----	7.02	5.81	8.37	3.91	3.98	4.18	2.59	3.74	3.52	4.00	3.87
Phosphoric acid -----	13.49	17.46	3.98	20.61	22.32	21.26	27.19	24.96	22.39	22.74	21.16
Cost per ton -----	\$35.00	35.00	29.60*	34-35	35.00	35.00	35.00	36.00	28.00	32.00	29.60*
Valuation per ton -----	\$38.32	39.34	22.50	39.97	41.00	39.14	44.51	44.22	36.28	38.81	38.31

* In Milford.



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